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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,998	03/17/2004	Ernest Rehmi Post	E-09	4404

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EXAMINER	
CONNOLLY, PATRICK J	
ART UNIT	**PAPER NUMBER**
2877	

DATE MAILED: 08/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/802,998	POST ET AL.	
	Examiner	Art Unit	
	Patrick J. Connolly	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41,43 and 44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,14-37,39-41 and 43* is/are rejected.

7)☒ Claim(s) *10-13 and 38* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 August 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

Claims 43 and 44 are objected to because of the following informalities: They appear out of order in the listing of claims. Further, **claim 42 appears to be missing from the specification entirely. As such it is assumed that claim 42 is a *canceled claim.*** Appropriate correction is required.

The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 37 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 37 recites the limitation "the orientation of the asymmetrical orbit" in line2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

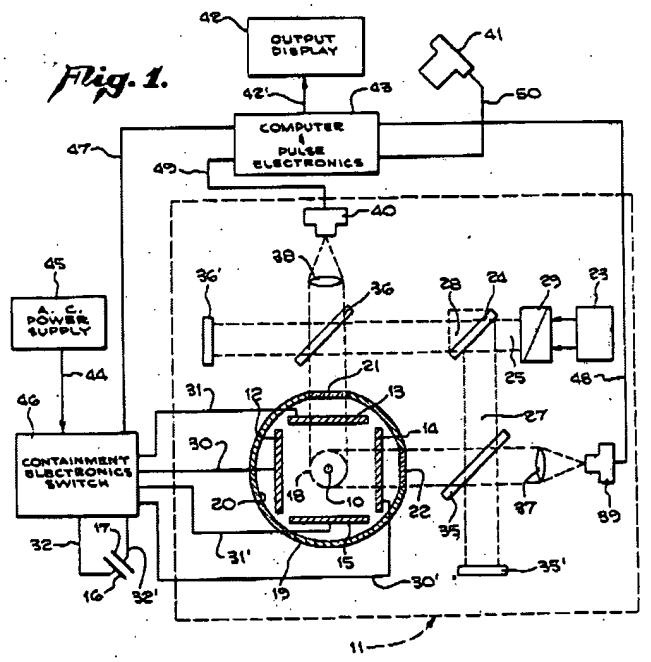
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 6, 8, 9, 14-19, 24-36, 43 and 44 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by U.S. Patent No. 4,384,487 to Browning (hereafter Browning).

As to claim 1, Browning discloses a dynamically restrained inertial reference instrument and reliability sensor including (see Figure 1 below):



an electrodynamic trap (spherical containment space: 18) for suspending a particle (10); and a readout device (computer, electronics and output display: 42, 43) for measuring variations of the particle when said trap is subject to acceleration (see abstract).

As to claim 2, Browning discloses a light source (23) directed at the charged particle and means for measuring the intensity of light (detectors: 39,40,41; computer and display: 42, 43) scattered by the particle (see column 5, lines 45-67 through column 6, lines 1-10).

As to claim 6, Browning discloses measuring variations in position or motion of the particle by interferometry (see column 5, lines 45-55).

As to claims 8 and 9, Browning discloses an alternate embodiment where the variation in position or motion of the particle is measured by detecting changes in the electric field via field absorption (see column 8, lines 34-49).

As to claim 14, Browning discloses electrodes (electrodes: 12, 13, 14, 15) with a time-varying potential in stable equilibrium (see column 7, lines 25-57).

As to claim 15, Browning discloses a ring electrode configuration substituted for four of the plate electrodes in combination with two other plate electrodes (16, 17: not pictured, see column 5, lines 24-29). An A.C. field is applied to said electrodes (see analysis with respect to claim 14 above).

As to claim 16, the application of the A.C. field to the electrode configuration of Browning would inherently establish a quadropole field between the electrodes.

As to claim 17, Browning discloses a linear force restoring the particle to a home position by means of the quadropole field (see column 8, lines 1-15).

As to claim 18, Browning discloses varying the restoring force (see column 8, lines 1-32).

As to claims 19 and 24, Browning discloses end cap electrodes on opposing sides of the ring (see analysis with respect to claim 15).

As to claims 25, 27 and 29, Browning discloses adjusting the voltage of the A.C. field applied to the electrodes that in turn varies the magnitude of the restoring force (see column 7: lines 37-46).

As to claim 26, Browning discloses a specific location of constraint for the particle (see analysis above; also Figure 1: containment space 18).

As to claim 28, see the analysis with respect to claim 10 above.

As to claim 30, Browning discloses a particle of a known mass and charge (see column 4: lines 3-22).

As to claims 31-33, Browning discloses the sensing mass may be an ion or a particle that is charged (see column 4, lines 2-14).

As to claim 34, Browning discloses that the sensing mass may be a hollow or spherical retroreflector (see column 5, lines 15-17).

As to claims 35 and 36, as Browning discloses tracking only one particle's motion, the movement of the particle's center of mass and micromotion would also be tracked.

As to claims 43 and 44, Browning discloses forming the electrodes via vacuum deposition of conductive material on optical quality flats. These optical flats are insulating materials, so as to allow direct, uninterrupted transmission of electromagnetic radiation, and separate the conducting from the insulating material.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3-5, 7, 20-23 and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Browning.

As to claim 3-5, Browning teaches using interferometers to monitor the position of the charge particle using an interferometric measurement of the scattered light from the particle.

Browning fails to teach focusing means for concentrating the light on the particle.

The Examiner takes Official Notice of the fact that it is well known in the art to use focusing means in combination with interferometric measurements of small objects so as to improve accuracy in measurement signals and imaging signals.

It would have been obvious to one of ordinary skill in the art at the time of invention to include focusing means in the apparatus of Browning so as to achieve a more accurate detection of the particle's motion.

As to claim 7, Browning teaches tracking the particle position by interferometry.

Browning fails to teach detecting the motion of the particle by optical leverage.

The Examiner takes Official Notice of the fact that it is well known in the art to use optical leverage to track particle positions as the method provides a stable, non-destructive method of position measurement.

It would have been obvious to one of ordinary skill in the art at the time of invention to use optical leverage to measure the particle position to achieve said advantage.

As to claims 20-23, Browning teaches two embodiments of the electrode arrangement including six plate electrodes, or alternately a ring electrode with plane electrode end caps.

Browning fails to teach hyperboloid, spherical, or ring-shaped endcaps.

With further regard to claim 23, Browning fails to teach a second ring electrode.

The Examiner takes Official Notice of the fact that many electrode arrangements are known to create quadropole conditions between them when the appropriate electric signals are

applied to them. Further, these arrangements would be chosen based upon the space limitations of the accelerometer device into which the quadropole generating arrangement is to be installed to optimize stability and compactness in the device.

It would have been obvious to one of ordinary skill in the art at the time of invention to choose an appropriate electrode arrangement with which to generate the quadropole of Browning so as to achieve optimum spatial configuration in relation to the rest of the accelerometer device.

Claims 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Browning as applied to the claims above, and further in view of U.S. Patent No. 3,965,753 to Browning Jr. (hereafter '753).

As to claims 39-41, Browning teaches suspending the particles in a vacuum-sealed environment.

Browning fails to teach damping by fluid or electrodynamic means.

'753 teaches an electrostatic accelerometer with a suspended particle including damping, both by gas and by electrical methods such as eddy currents (see column 13, lines 2-7) as appropriate to the level of G forces the accelerometer is experiencing so as to maintain stability and accuracy in monitoring the particle (see remainder of column 13).

It would have been obvious to one of ordinary skill in the art at the time of invention to include the damping arrangements of '753 in the accelerometer of Browning so as to achieve stable and accurate acceleration measurements in a variety of accelerating environments.

Allowable Subject Matter

Claims 10-13 and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As to claim 10, the prior art of record, taken alone or in combination, fails to disclose or render obvious an inertial sensor including the combination of: an electrodynamic trap and a readout device that measures the position or motion of the particle or particles by imaging, in combination with the rest of the limitations of claim 10.

As to claim 38, the prior art of record, taken alone or in combination, fails to disclose or render obvious an inertial sensor including the combination of: an electrodynamic trap suspending more than one particle and wherein the readout means detects variations in the relative positions occupied by different particles, in combination with the rest of the limitations of claim 38.

"Several facts have been relied upon from the personal knowledge of the examiner about which the examiner took Official Notice. Applicant must seasonably challenge well known statements and statements based on personal knowledge when they are made by the Board of Patent Appeals and Interferences. In re Selmi, 156 F.2d 96, 70 USPQ 197 (CCPA 1946); In re Fischer, 125 F.2d 725, 52 USPQ 473 (CCPA 1942). See also In re Boon, 439 F.2d 724, 169 USPQ 231 (CCPA 1971) (a challenge to the taking of judicial notice must contain adequate information or argument to create on its face a reasonable doubt regarding the circumstances justifying the judicial notice). If applicant does not seasonably traverse the well-known statement during examination, then the object of the well known statement is taken to be admitted prior art. In re Chevenard, 139 F.2d 71, 60 USPQ 239 (CCPA 1943). A seasonable challenge constitutes a demand for evidence made as soon as practicable during prosecution. Thus, applicant is charged with rebutting the well-known statement in the **next reply** after the Office action in which the well known statement was made."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick J. Connolly whose telephone number is 571.272.2412. The examiner can normally be reached on 9:00 am - 7:00 pm Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on 571.272.2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Patrick Connolly 07.27.2006
Patrick Connolly